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Papua New Guinea

PETROLEUM EXPLORATION OPPORTUNITIES

Papua New Guinea presents an exceptional opportunity for oil explorationalists seeking to expand their activities into a highly prospective yet unexplored region within a stable political and economic environent.

Recent discoveries of major oil, gas and condensate accumulations have verified Papua New Guinea's potential to contain giant oil fields. It is situated in a broad tectonic zone already yielding major fields in other countries.

Papua New Guinea's sedimentary basins remain relatively unexplored providing extensive opportunity for frontier exploration. The recent successes have resulted in an upsurge of activity, establishing experienced support services for exploration companies.

An equitable fiscal package based on project profitability rather than royalties reflects the government's desire to promote exploration and development. A stable Western style government has allowed consistent policies, restricting risk to normal commercial and technical parameters.

Prospecting licences are primarily awarded on the basis of work programmes with no bonus payment required. Raw historic exploration data is held at the government archives and reports synthesising and interpreting this data for each sedimentary basin may be purchased from the Geological Survey.

Petroleum exploration and development in Papua New Guinea is subject to an established legislative, contractual and fiscal system providing competitive conditions and a stable environment for operators.

ADMINISTRATION

Petroleum activity is regulated under the Petroleum Act and is the responsibility of the Minister for Minerals and Energy. Administration and technical support is carried out by the Department of Minerals and Energy.

Procedures for considering and granting exploration and development licences are stipulated in the Act, ensuring consistent treatment of operators.

A professional unit in the Department administers and monitors petroleum activities. It provides information to operators on geological and policy matters and the availability of support services.

EXPLORATION

Petroleum Prospecting Licences (PPL) are granted for six years with a five year extension period. Tenements typically cover up to 5200 square kilometers.

PPLs are granted on the basis of a work programme consistent with the prospectivity and geological knowledge of the tenement. Guidelines for acceptable work programmes should be discussed with the Department prior to application.

Granting of exploration licences is routine and typically takes between six to eight weeks from time of application. Licence fees are modest with no signature bonus payable.

PETROLEUM AGREEMENT

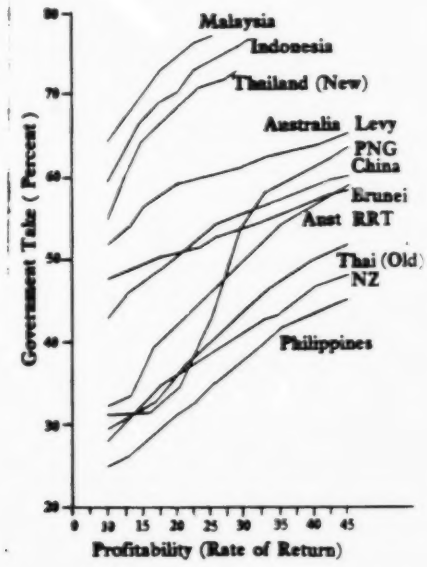
The Petroleum Agreement is a legal contract which sets out the PPL holder's rights and obligations with respect to matters such as the appraisal and development process, currency repatriation, facility ownership and use, and training.

The State's right to acquire up to 22½% interest in a development on a carried basis is also defined in the Agreement.

FISCAL REGIME

Papua New Guinea has a competitive petroleum tax regime which recognises the need for developers to receive an acceptable return for risk development capital.

The essential elements of this regime include: 1.25% royalty, 50% conventional corporate tax, 50% additional profits tax after recovery of the initial investment plus 27% rate of return, and provisions for accelerated depreciation.



Source: Wood Mackenzie & Co. Ltd

Papuan Basin

The Papuan Basin is effectively a continuation of the Carpentaria Basin in North Queensland and therefore part of the Australian plate.

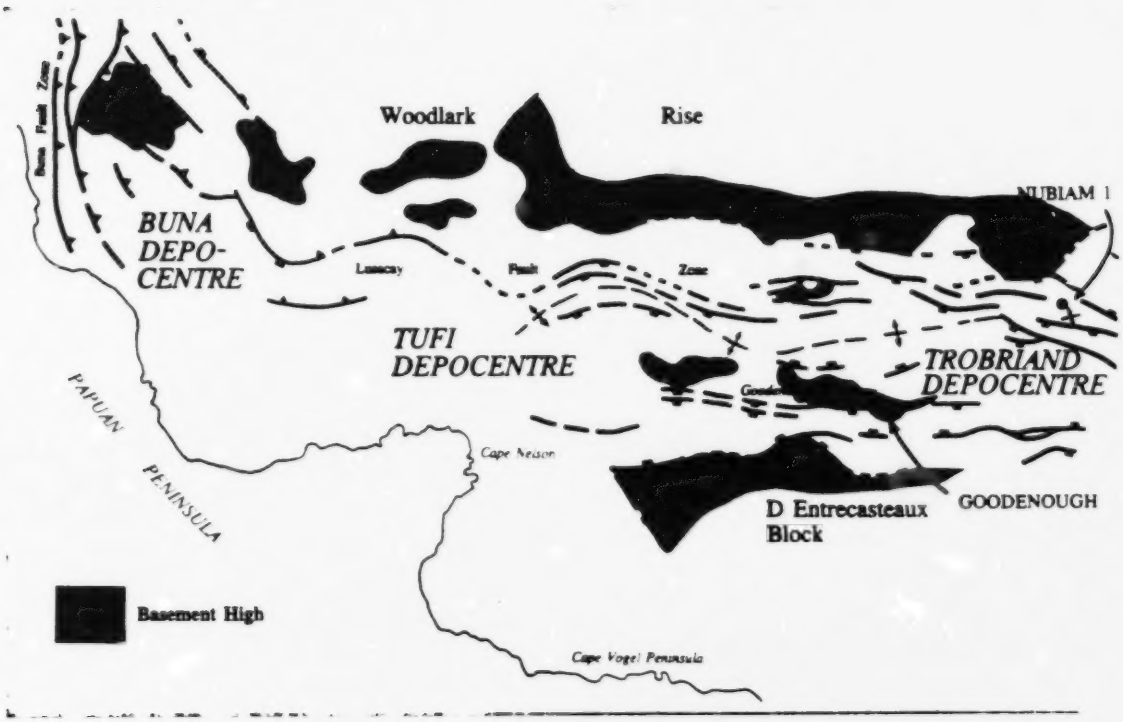
The simplified stratigraphy of of the Western Papuan Basin is:

Tertiary shelf limestone
Tertiary sandstone
Cretaceous Ieru marine shale and minor sandstone
Lower Cretaceous-Jurassic Toro quartz sandstone
Jurassic Imburu shale and sandstone
Jurassic Koi-Iange sandstone

To the west the Toro Sandstone and lower beds lap out at Lake Murray. To the north, the Mesozoic section thickens and becomes volcanoclastic eventually passing into basement under the North New Guinea Basin. To the east the Papuan Basin thickens by the addition of clastic Tertiary beds. In this area are also buried Tertiary reefs including the Pasca gas condensate field and the Pandora gasfield. The northern and eastern extent of the Toro Sandstone, the main reservoir bed of the Papuan Basin is a matter for surmise at present. The Toro Sandstone in the fold belt is about 90 metres thick and has 15% porosity. The Tertiary reefs have similar porosity.

The structure of the basin consists of an overthrust belt of Upper Miocene age in the north and fold structure parallel to it to the south. It is not certain how far north the thrusting extends, but thrusting has been mapped in the South Sepik area by Papua New Guinea Geological Survey geologists and noted on seismic lines in the North New Guinea Basin.

Cape Vogel Basin



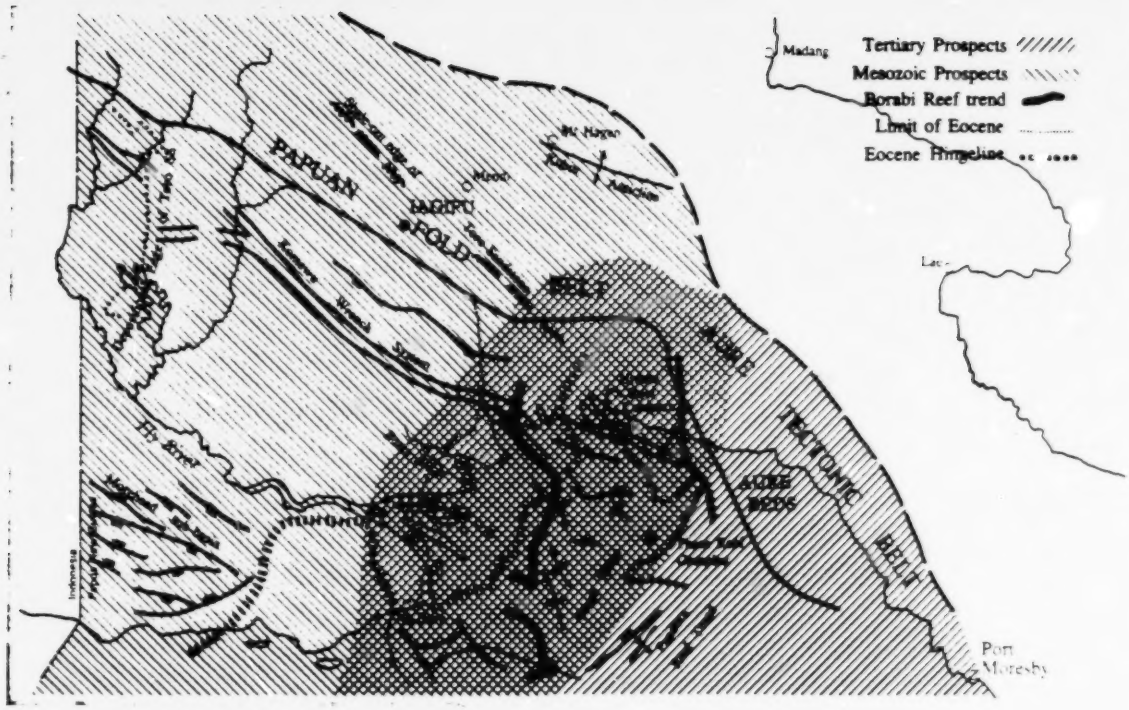
North New Guinea Basin

The North New Guinea Basin in Papua New Guinea extends from the Indonesian border to the Finisterre Range in the east and is bounded by the northern coast of mainland New Guinea and the central highlands to the south. It consists of three sub-basins; the Aitape bounded to the South by the Bewani and Toricelli mountains, the Sepik including the Sepik river valley, and the Ramu in the east including the Ramu valley and lower Sepik.

Seven exploratory wells have been drilled in the basin, all but two of which were probably not valid tests. Gas and oil shows were present in most holes and occurred in all sub-basins. Shows of gas and oil were also found in twelve shallow bores drilled to depths of up to 40 feet on the coast north of Wewak in the 1920's. A number of oil and gas seeps have been recorded in the hinterland between Vanimo and Wewak.

A total of eighteen leads or groups of leads have been identified by the Department of Minerals and Energy from available geological and geophysical data as warranting further investigation. Seven were identified from surface geological data, two from a combination of surface geology and nine from seismic surveys. All will require more defined seismic interpretation through reprocessing or additional regional reconnaisance to improve the validity of the prospects.

Most of the basin remains vacant with existing licences concentrated in the Aitape sub-basin and the Ramu valley.

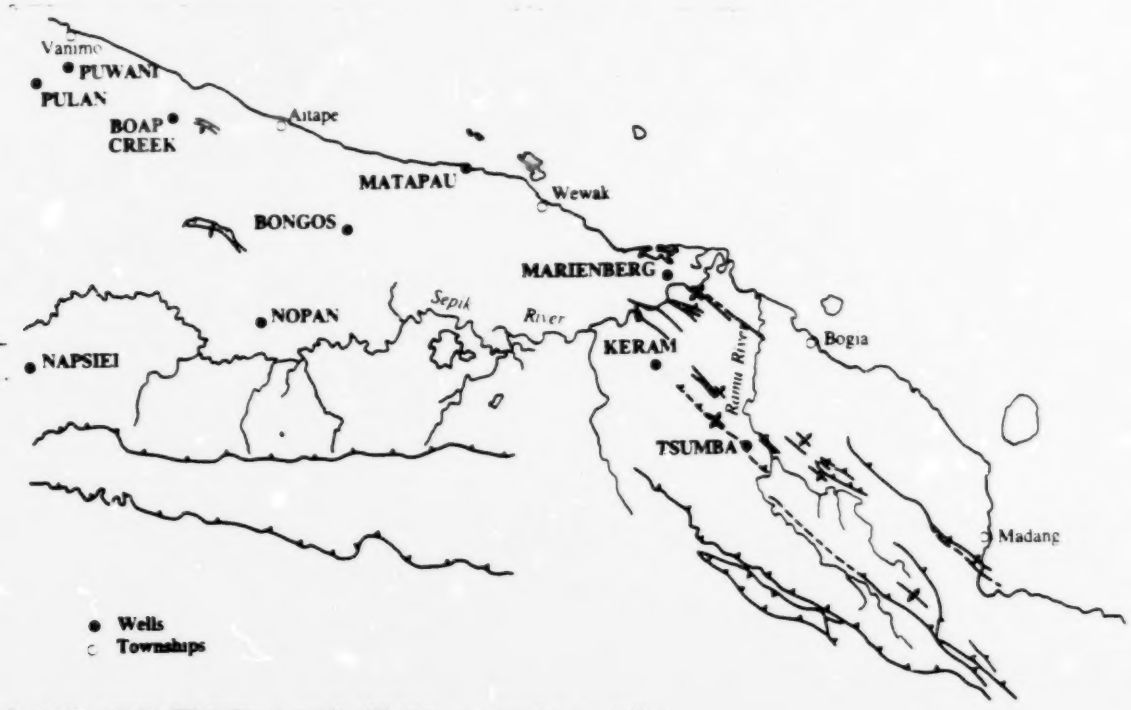


The Cape Vogel Basin lies to the east of the south eastern Papua New Guinea mainland. It consists of three depocentres with sedimentary section in excess of 6000 metres, sufficient for hydrocarbon generation.

Three shallow onshore wells were drilled in 1928, the deepest reaching 310 metres after encountering shows of gas and light oil. In 1975 two wells were drilled in the Trobriand depocentre at the east of the basin to test reefal anomalies but were unsuccessful. Reflection seismic data was acquired in 1972-4 and 1985.

Re-evaluation of existing seismic data by the Department of Minerals and Energy using well results and onshore geological data has revealed a wide variety of structural and stratigraphic trapping possibilities. Features identified include anticlines and fault unconformity traps in the Buna and Trobriand depocentres and pinchouts on basement highs in the Trobriand. The best reservoir potential exists in Tertiary reefs but there are also sandstone prospects. There is a major closed structure seismically mapped 75 km long.

Stratigraphic and seismic data on the Cape Vogel Basin remains sparse. The acquisition of modern, higher resolution seismic reflection data will allow refinement of existing play concepts and will likely lead to the recognition of additional, more subtle trap types. No licences are presently held over the basin.



Exploration Activity

Opportunities exist for companies wishing to explore in Papua New Guinea to farmin to existing licences in the Papuan Basin or to take out new licences in vacant areas.

HISTORY

Since exploration activity began in the early 1920's, over 150 wells have been drilled, though only since 1956 has drilling and geophysical technology enabled valid tests of structures.

Activity has centred on the Papuan Basin, with the country's other five Basins remaining largely unexplored.

DISCOVERIES

Spectacular discoveries of oil, gas and condensate have been made since 1984 in the Papuan Fold Belt. All are associated with the Toro Sandstone present over much of the Papuan Basin. Earlier discoveries were made in Tertiary limestones in the same basin.

Discovery	Year	Type	Unit	Possible Reserves
Kuru	1956	Gas	Shelf Limestone	0.1 TCF
Barikewa	1958	Gas	Toro Sandstone	0.3 TCF
Puri	1958	Oil	Shelf Limestone	—
Iehi	1960	Gas	Toro Sandstone	0.3 TCF
Bwata	1960	Gas, condensate	Shelf Limestone	0.5 TCF 0.3 mmbbl
Uramu	1968	Gas, condensate	Reef Limestone	0.2 TCF 0.4 mmbbl
Pasca	1968	Gas, condensate	Reef Limestone	0.3 TCF 36 mmbbl
Juha	1984	Gas, condensate	Toro Sandstone	1.3 TCF 80 mmbbl
Iagifu	1986	Oil	Toro Sandstone	0.8 TCF 300 mmbbl
SE Hedinia	1987	Gas, oil	Toro Sandstone	2 TCF ? mmbbl
Hides	1987	Gas, condensate	Toro Sandstone	1.5 TCF 20 mmbbl
Hedinia	1988	Gas, oil	Toro Sandstone	2.4 TCF ?00 mmbbl
Pandora	1988	Gas	Reef Limestone	3 TCF

ONGOING ACTIVITIES

Forty two PPL's are in effect or under application with over 100 wells included in the work programme obligations. All but seven PPL's are situated in the Papuan Basin.

The licences are held by some twenty four groups, including major companies involved in intensive drilling programmes and small companies engaged in early survey work. Some smaller operators hold highly prospective areas near discoveries and are seeking farming partners as they near drilling obligations.

DEVELOPMENTS

The Hides and the Iagifu-Hedinia discoveries will almost certainly be developed in 1989-90. The newly discovered offshore Pandora gas field is likely to be of an exploitable size.

These developments will establish infrastructure and promote the establishment of service industries which will facilitate new developments.

Petroleum Prospecting Licences (August 1988)

Number	Basin	On/Off shore	Granted	Operator
27	Papuan	On	November 1986 (E)	BP Australia
30	Papuan	On/Off	September 1986 (E)	Petro — Canada
31	NNG	On	September 1986 (E)	Toutu No 86
51	Papuan	On/Off	June 1983	Kundu Exploration
56	Papuan	On	December 1985	Base Resources
59	Papuan	Off	February 1986	Overseas Petroleum Investment
60	Papuan	On/Off	March 1986	Southeastern Oil and Gas
63	Papuan	Off	March 1986	Premier Oilfields
66	Papuan	On/Off	August 1986	Toutu No 84
68	Papuan	On	March 1986	Kundu Exploration
69	Papuan	On	March 1986	Kundu Exploration
74	Papuan	On	November 1986	Toutu No 85
76	Papuan	On	November 1986	Erave Petroleum
77	Papuan	On	December 1986	Peabody Ventures
78	NNG	On	November 1986	Toutu No 86
81	Papuan	On	March 1987	Santos
82	Papuan	Off	February 1987	International Petroleum Corporation
85	Papuan	Off	February 1987	Premier Oilfields
86	Papuan	On	July 1987	BP Australia
87	Papuan	On/Off	July 1987	Papuan Gulf Petroleum
89	Papuan	On	July 1987	Lakes Oil (PNG)
93	Papuan	On	July 1987	Rigg Exploration
94	Papuan	On	November 1987	Bosavi Exploration
95	Papuan	Off	July 1987	International Petroleum Corporation
96	Bougainville	Off	Application	International Petroleum Corporation
98	Papuan	Off	December 1987	Papuan Gulf Petroleum
99	Papuan	On	December 1987	Papuan Gulf Petroleum
100	Papuan	On	August 1987	Chevron Niugini
101	Papuan	On	August 1987	Chevron Niugini
102	Papuan	On	December 1987	Gedd Inc
103	NNG	On	December 1987	Papuan Gulf Petroleum
105	NNG	On/Off	February 1988	Armadale One
106	Papuan	On	February 1988	Victoria Exploration
108	Papuan	On	February 1988	TMOC Resources
109	Papuan	On/Off	November 1988	Southeastern Oil and Gas
112	Papuan	On/Off	August 1988	Cahill
113	Papuan	On/Off	August 1988	Continental Oil NL
116	Papuan	Off	Application	International Petroleum Corporation
117	Papuan	On	Application	Victoria Exploration
118	Papuan	On/Off	Application	International Petroleum Corporation
119	Cape Vogel	Off	Application	Cordura Exploration
120	NNG	On/Off	Application	Anderman Smith

E: Extension NNG: North New Guinea Basin

INFORMATION AVAILABLE

The Department of Minerals and Energy has synthesised and interpreted open file exploration data from the principal sedimentary basins of Papua New Guinea. Historical data is summarised and prospects identified. Major reports available include:

Petroleum Potential of the Papuan Basin
Petroleum Potential of the North New Guinea Basin
Petroleum Potential of the Cape Vogel, Bougainville and New Ireland Basins
Petroleum Potential of the Eastern Papuan Basin
Aspects of Stratigraphy and Sedimentology of the Toro Sandstone.

Enquiries should be directed to:

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